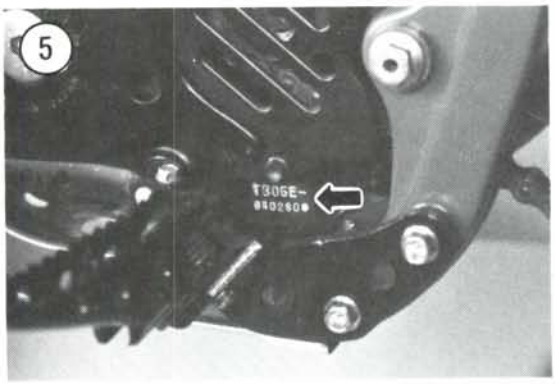
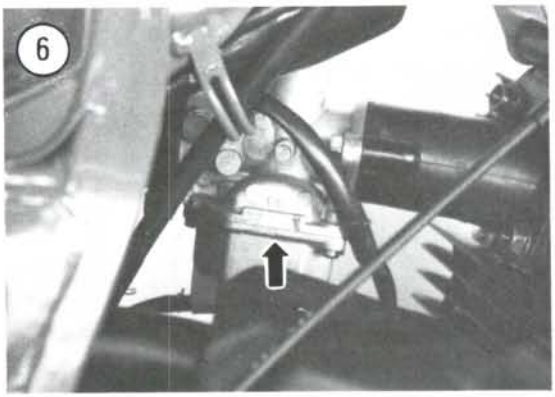




thickness needed. Installation of a too-thick or too-thin gasket in a critical area could cause engine damage.

EXPENDABLE SUPPLIES

Certain expendable supplies are required during maintenance and repair work. These include grease, oil, gasket cement, wiping rags and cleaning solvent. Ask your dealer for the special locking compounds, silicone lubricants and other products (**Figure 2**) which make vehicle maintenance simpler and easier. Cleaning solvent or kerosene is available at some service stations or hardware stores.

PARTS REPLACEMENT

Honda makes frequent changes during a model year—some minor, some relatively major. When you order parts from the dealer or other parts distributor, always order by engine and frame number. Write the numbers down and carry them with you. Compare new parts to old before purchasing them. If they are not alike, have the parts manager explain the difference to you.

SERIAL NUMBERS

You must know the model serial number (frame and/or engine) and vehicle identification number (VIN) for registration purposes and when ordering replacement parts.

The frame serial number is located as follows:

a. 3-wheeled models: stamped on the right-hand side of the steering head (**Figure 3**).
b. 4-wheeled models: stamped on the left-hand frame down tube under the seat (**Figure 4**).

The engine serial number is located on the lower left-hand side of the crankcase behind the gear shift lever (**Figure 5**). The carburetor serial number is located on the right-hand side of the carburetor body above the float bowl (**Figure 6**).

BASIC HAND TOOLS

A number of tools are required to maintain an ATV in top riding condition. You may already have some of these tools for home or car repairs. There are also tools made especially for motorcycle and ATV repairs; these you will have to purchase. In any case, a wide variety of quality tools will make ATV repairs easier and more effective.

Top quality tools are essential; they are also more economical in the long run. If you are now starting to build your tool collection, stay away from the "advertised specials" featured at some parts houses, discount stores and chain drug stores. These are usually a poor grade tool that can be sold cheaply and that is exactly what they are—*cheap*. They are usually made of inferior material and are thick, heavy and clumsy. Their rough finish makes them difficult to clean and they usually don't last very long. Quality tools are made of alloy steel and are heat treated for greater strength. They are lighter and better balanced than cheap ones. Their surface is smooth, making them a pleasure to work with and easy to clean. The initial cost of good quality tools may be more, but it is cheaper in the long run. Don't try to buy everything in all sizes in the beginning; do it a little at a time until you have the necessary tools.

Keep your tools clean and in a tool box. Keep them organized with the sockets and related drives together and the open end and box wrenches together, etc. After using a tool, wipe off dirt and grease with a clean cloth and place the tool in its correct place. Doing this will save a lot of time you would have spent trying to find a socket buried in a bunch of clutch parts.

The following tools are required to perform virtually any repair job on an ATV. Each tool is described and the recommended size given for

starting a tool collection. **Table 2** includes the tools that should be on hand for simple home repairs and/or major overhaul as shown in **Figure 7**. Additional tools and some duplicates may be added as you become more familiar with the ATV. Almost all motorcycles and ATV's (with the exception of the U.S. built Harley and some English bikes) use metric size bolts and nuts. If you are starting your collection now, buy metric sizes.

Screwdrivers

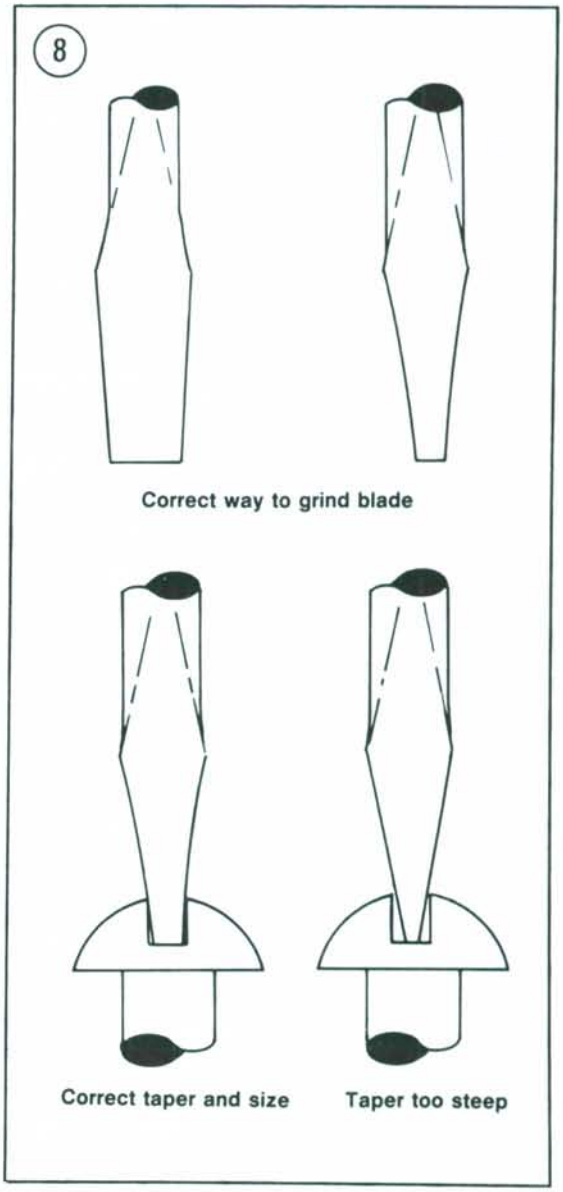
The screwdriver is a very basic tool, but if used improperly it will do more damage than good. The slot on a screw has a definite dimension and shape. A screwdriver must be selected to conform with that shape. Use a small screwdriver for small screws and a large one for large screws or the screw head will be damaged.

Two basic types of screwdriver are required to repair the bike—a common (flat blade) screwdriver and the Phillips screwdriver.

Screwdrivers are available in sets which often include an assortment of common and Phillips blades. If you buy them individually, buy at least the following:

a. Common screwdriver—5/16×6 in. blade.
b. Common screwdriver—3/8×12 in. blade.
c. Phillips screwdriver—size 2 tip, 6 in. blade.

Use screwdrivers only for driving screws. Never use a screwdriver for prying or chiseling. Do not try to remove a Phillips or Allen head screw with a common screwdriver; you can damage the head so that the proper tool will be unable to remove it. Keep screwdrivers in the proper condition and they will last longer and perform better. Always keep the tip of a common screwdriver in good condition. **Figure 8** shows how to grind the tip to the proper shape if it becomes damaged. Note the symmetrical sides of the tip.



Pliers

Pliers come in a wide range of types and sizes. Pliers are useful for cutting, bending and crimping. They should never be used to cut hardened objects or to turn bolts or nuts. **Figure 9** shows several pliers useful in ATV repairs.

Each type of pliers has a specialized function. Gas pliers are general purpose pliers and are used mainly for holding things and for bending. Vise Grips are used as pliers or to hold objects very tight like a vise. Needlenose pliers are used to hold or bend small objects. Channel lock pliers can be adjusted to hold various sizes of objects; the jaws remain parallel to grip around objects such as pipe or tubing. There are many more types of pliers.

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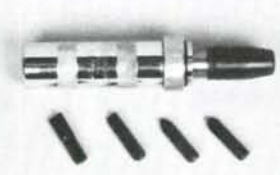

The ones described here are most suitable for ATV repairs.

Box and Open-end Wrenches

Box and open-end wrenches are available in sets or separately in a variety of sizes (**Figure 10**). The size number stamped near the end refers to the distance between 2 parallel flats on the hex head bolt or nut.

Box wrenches are usually superior to open-end wrenches. Open-end wrenches grip the nut on only 2 flats. Unless it fits well, it may slip and round off the points on the nut. The box wrench grips all 6 flats. Both 6-point and 12-point openings on box wrenches are available. The 6-point gives superior holding power; the 12-point allows a shorter swing.

Combination wrenches which are open on one side and boxed on the other are also available. Both ends are the same size.

Adjustable (Crescent) Wrenches

An adjustable wrench (also called a crescent wrench) can be adjusted to fit nearly any nut or bolt head. See **Figure 11**. However, it can loosen and slip, causing damage to the nut and injury to your knuckles. Use an adjustable wrench only when other wrenches are not available.

Crescent wrenches come in sizes ranging from 4-18 in. overall. A 6 or 8 in. wrench is recommended as an all-purpose wrench.

Socket Wrenches

This type is undoubtedly the fastest, safest and most convenient to use. See **Figure 12**. Sockets which attach to a ratchet handle are available with 6-point or 12-point openings and 1/4, 3/8, 1/2 and 3/4 inch drives. The drive size indicates the size of the square hole which mates with the ratchet handle.

Torque Wrench

A torque wrench is used with a socket to measure how tightly a nut or bolt is installed. They come in a wide price range and with either 3/8 or 1/2 in. square drive. The drive size indicates the size of the square drive which mates with the socket. Purchase one that measures 0-140 N•m (0-100 ft.-lb.).

Impact Driver

This tool might have been designed with the ATV in mind. See **Figure 13**. It makes removal of engine and clutch parts easy and eliminates damage to bolts and screw slots. This tool is

available at most large hardware, motorcycle or auto parts stores.

Circlip Pliers

Circlip pliers (sometimes referred to as snap-ring pliers) are necessary to remove the circlips used on the transmission shaft assemblies. See **Figure 14**.

Hammers

The correct hammer is necessary for ATV repairs. Use only a hammer with a face (or head) of rubber or plastic or the soft-faced type that is filled with buckshot. These are sometimes necessary in engine teardowns. *Never* use a metal-faced hammer on the ATV as severe damage will result in most cases. You can always produce the same amount of force with a soft-faced hammer.

Ignition Gauge

This tool has both flat and wire measuring gauges and is used to measure spark plug gap (**Figure 15**). This device is available at most auto or motorcycle supply stores.

Other Special Tools

A few other special tools may be required for major service. These are described in the appropriate chapters and are available from Honda dealers or other manufacturers as indicated.

TUNE-UP AND TROUBLESHOOTING TOOLS

Multimeter or Volt-ohm Meter

This instrument (**Figure 16**) is invaluable for electrical system troubleshooting and service. A few of its functions may be duplicated by homemade test equipment, but for the serious mechanic it is a must. Its uses are described in the applicable sections of the book.

Strobe Timing Light

This instrument is necessary for checking the ignition timing. By flashing a light at the precise instant the spark plug fires, the position of the timing mark can be seen. Marks on the starter clutch assembly line up with the stationary mark on the crankcase cover while the engine is running.

Suitable lights range from inexpensive neon bulb types to powerful xenon strobe lights. See **Figure 17**. Neon timing lights are difficult to see and must be used in dimly lit areas. Xenon strobe timing lights can be used outside in bright sunlight. Both types work on the bike; use according to the manufacturer's instructions.